

(LiMn2F4), nonstoichiometric 815609-28-0D, Lithium manganese sulfide (LiMn2S4), nonstoichiometric 815609-30-4D, Chromium lithium fluoride (CrLiF2), doped, nonstoichiometric 815609-31-5D, Lithium manganese fluoride (LiMnF2), doped, nonstoichiometric 815609-32-6D, Lithium strontium fluoride (LiSrF2), doped, nonstoichiometric 815609-34-8D, Lanthanum lithium fluoride (LaLiF2), doped, nonstoichiometric 815609-36-0D, Cerium lithium fluoride (CeLiF2), doped, nonstoichiometric  
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
 (manganese anode active material production for lithium ion battery)

L18 ANSWER 2 OF 4 REGISTRY COPYRIGHT 2007 ACS on STN  
 RN 815609-26-8 REGISTRY  
 ED Entered STN: 18 Jan 2005  
 CN Lithium manganese fluoride (LiMn2F4) (9CI) (CA INDEX NAME)  
 MF F . Li . Mn  
 AF F4 Li Mn2  
 CI TIS  
 SR CA  
 LC STN Files: CA, CAPLUS  
 DT.CA Caplus document type: Patent  
 RLD.P Roles for non-specific derivatives from patents: USES (Uses)

Component	Ratio	Component Registry Number
=====	=====	=====
F	4	14762-94-8
Mn	2	7439-96-5
Li	1	7439-93-2

1 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

#### REFERENCE 1

AN 142:97386 CA  
 TI Manganese based anode active material production for lithium ion battery  
 IN Kwon, Ho Jin  
 PA Samsung SDI Co., Ltd., S. Korea  
 SO Repub. Korean Kongkae Taeho Kongbo, No pp. given  
 CODEN: KRXXA7  
 DT Patent  
 LA Korean  
 IC ICM H01M010-36  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 49

#### FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	KR 2001063879	A	20010709	KR 1999-61983	19991224
PRAI	KR 1999-61983		19991224		

AB A manganese based anode active material is provided for efficient preparation of the Mn-based material having improved life time at high temperature, thermal stability and electrochem. properties by utilizing specific materials capable of reverse intercalation and deintercalation of lithium ions. The Mn based anode active material having spherical particles of 20-50- $\mu$ m diameter agglomerated with microfine particles of  $\geq 1$   $\mu$ m-diameter is selected from LixMO2, LixMnS2, LixMF2, LixMnO2-zFz, LixMnO2-zSz, LixMnO2-zPz, LixMn1-yMyO2, LixMn1-yMyO2-zSz, LixMn2O4, LixMn2S4 and LixMn2F4 (where x=0.9-1.1; yr=0-0.5; z=0-1.95; M is Mg, Al, Cr, Fe, Mn, Sr, La, Ce and their combinations). The active material is prepared by adding organic solvent to lithium and manganese salts to form a mixture; agitating and vaporizing the solvent to form a precursor; and thermally

processing the precursor.

ST manganese anode prodn lithium ion battery

IT Secondary batteries  
(lithium, cathodes; manganese anode active material production for lithium ion battery)

IT Dissolution  
Heat treatment  
(manganese anode active material production for lithium ion battery)

IT Salts, uses  
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(manganese anode active material production for lithium ion battery)

IT Fluorides, uses  
Sulfides, uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(manganese anode active material production for lithium ion battery)

IT Oxides (inorganic), uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(oxide phosphides; manganese anode active material production for lithium ion battery)

IT Oxides (inorganic), uses  
Sulfides, uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(oxide sulfides; manganese anode active material production for lithium ion battery)

IT Fluorides, uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(oxyfluorides; manganese anode active material production for lithium ion battery)

IT 7439-93-2D, Lithium, salts 7439-96-5D, Manganese, salts  
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(manganese anode active material production for lithium ion battery)

IT 12003-67-7D, Aluminum lithium oxide ( $\text{AlLiO}_2$ ), doped, nonstoichiometric  
12017-96-8D, Chromium lithium oxide ( $\text{CrLiO}_2$ ), doped, nonstoichiometric  
12022-46-7D, Iron lithium oxide ( $\text{FeLiO}_2$ ), doped, nonstoichiometric  
12057-17-9D, Lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ), nonstoichiometric  
12142-59-5D, Lanthanum lithium oxide ( $\text{LaLiO}_2$ ), doped, nonstoichiometric  
12162-79-7D, Lithium manganese oxide ( $\text{LiMnO}_2$ ), doped, nonstoichiometric  
39327-44-1D, Lithium fluoride ( $\text{LiF}_2$ ), doped, nonstoichiometric  
57349-02-7D, Cerium lithium oxide ( $\text{CeLiO}_2$ ), doped, nonstoichiometric  
147551-83-5D, Lanthanum lithium manganese oxide ( $(\text{La,Mn})\text{LiO}_2$ ), doped, nonstoichiometric  
195144-63-9D, Lithium oxide ( $\text{LiO}_2$ ), doped, nonstoichiometric  
367267-66-1D, Iron lithium manganese oxide ( $\text{Fe}(\text{Li,Mn})\text{O}_2$ ), doped, nonstoichiometric  
425622-71-5D, Aluminum lithium manganese oxide ( $(\text{Al,Mn})\text{LiO}_2$ ), doped, nonstoichiometric  
435268-41-0D, Chromium lithium manganese oxide ( $(\text{Cr,Mn})\text{LiO}_2$ ), doped, nonstoichiometric  
815609-07-5D, Iron lithium fluoride ( $\text{FeLiF}_2$ ), doped, nonstoichiometric  
815609-08-6D, Lithium strontium oxide ( $\text{LiSrO}_2$ ), doped, nonstoichiometric  
815609-09-7D, Lithium manganese oxide sulfide ( $\text{LiMn}(\text{O,S})_2$ ), nonstoichiometric  
815609-10-0D, Lithium manganese fluoride oxide ( $\text{LiMn}(\text{F,O})_2$ ), nonstoichiometric  
815609-11-1D, Lithium manganese oxide phosphide ( $\text{LiMn}(\text{O,P})_2$ ), nonstoichiometric  
815609-13-3D, Lithium manganese sulfide ( $\text{LiMnS}_2$ ), nonstoichiometric  
815609-14-4D, Lithium manganese strontium oxide ( $\text{Li}(\text{Mn,Sr})\text{O}_2$ ), doped, nonstoichiometric  
815609-15-5D, Cerium lithium manganese oxide ( $(\text{Ce,Mn})\text{LiO}_2$ ), doped, nonstoichiometric  
815609-16-6D, Lithium magnesium manganese oxide ( $\text{Li}(\text{Mg,Mn})\text{O}_2$ ), doped, nonstoichiometric  
815609-17-7D, Lithium magnesium fluoride ( $\text{LiMgF}_2$ ), doped, nonstoichiometric  
815609-18-8D, doped, nonstoichiometric  
815609-19-9D, Aluminum lithium manganese oxide sulfide

((Al,Mn)Li(O,S)2), doped, nonstoichiometric 815609-20-2D, Chromium lithium manganese oxide sulfide ((Cr,Mn)Li(O,S)2), doped, nonstoichiometric 815609-21-3D, Iron lithium manganese oxide sulfide ((Fe,Mn)Li(O,S)2), doped, nonstoichiometric 815609-22-4D, doped, nonstoichiometric 815609-23-5D, doped, nonstoichiometric 815609-24-6D, Cerium lithium manganese oxide sulfide ((Ce,Mn)Li(O,S)2), doped, nonstoichiometric 815609-25-7D, Aluminum lithium fluoride (AlLiF2), doped, nonstoichiometric 815609-26-8D, Lithium manganese fluoride (LiMn2F4), nonstoichiometric 815609-28-0D, Lithium manganese sulfide (LiMn2S4), nonstoichiometric 815609-30-4D, Chromium lithium fluoride (CrLiF2), doped, nonstoichiometric 815609-31-5D, Lithium manganese fluoride (LiMnF2), doped, nonstoichiometric 815609-32-6D, Lithium strontium fluoride (LiSrF2), doped, nonstoichiometric 815609-34-8D, Lanthanum lithium fluoride (LaLiF2), doped, nonstoichiometric 815609-36-0D, Cerium lithium fluoride (CeLiF2), doped, nonstoichiometric  
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 (manganese anode active material production for lithium ion battery)

L18 ANSWER 3 OF 4 REGISTRY COPYRIGHT 2007 ACS on STN  
 RN 289713-47-9 REGISTRY  
 ED Entered STN: 20 Sep 2000  
 CN Lithium manganese fluoride (9CI) (CA INDEX NAME)  
 MF F . Li . Mn  
 CI TIS  
 SR CA  
 LC STN Files: CA, CAPLUS, USPATFULL  
 DT.CA CAplus document type: Patent  
 RL.P Roles from patents: PREP (Preparation); USES (Uses)

Component	Ratio	Component Registry Number
=====	=====	=====
F	x	14762-94-8
Mn	x	7439-96-5
Li	x	7439-93-2

4 REFERENCES IN FILE CA (1907 TO DATE)  
 4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

#### REFERENCE 1

AN 141:57110 CA  
 TI Metal fluorides as electrode materials for rechargeable batteries  
 IN Amatucci, Glenn G.  
 PA USA  
 SO U.S. Pat. Appl. Publ., 26 pp., Cont.-in-part of U.S. Pat. Appl. 2004 62,994.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H01M004-58  
 ICS C01D003-02  
 NCL 429231950  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 2004121235	A1	20040624	US 2003-721924	20031125
	US 2004062994	A1	20040401	US 2002-261863	20021001
	US 2006019163	A1	20060126	US 2005-177729	20050708
PRAI	US 2002-261863		20021001		
	US 2002-429492P		20021127		
	US 2003-721924		20031125		